



**ELIZADE UNIVERSITY**

**ILARA-MOKIN**

**ONDO STATE**

**FACULTY: Basic and Applied Sciences**  
**DEPARTMENT: Physical and Chemical Sciences**  
**SECOND SEMESTER EXAMINATIONS**  
**2018/2019 ACADEMIC SESSION**

**COURSE CODE: PHY 212**

**COURSE TITLE: ANALOG ELECTRONICS**

**DURATION: 2 HOURS**

**HOD's SIGNATURE**

**TOTAL MARKS:**

**Matriculation Number:** \_\_\_\_\_

**INSTRUCTIONS:**

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 1 page with printing on both sides.
3. Answer all questions in the exam booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers. Marks will be deducted for untidy work.
6. Attempt any four of the six questions

(i)  
(j)

**QUESTION ONE**

(a) The plates of a parallel-plate capacitor in vacuum are 7.00mm apart and  $3.00\text{m}^2$  in area. A potential difference of 10,000V is applied across the capacitor. Compute

- (i) the capacitance
- (ii) the charge on each plate
- (iii) the magnitude of the electric field in the space between them.

(b) Find the equivalent capacitance between a and b for the capacitors network shown in fig. 1 below.

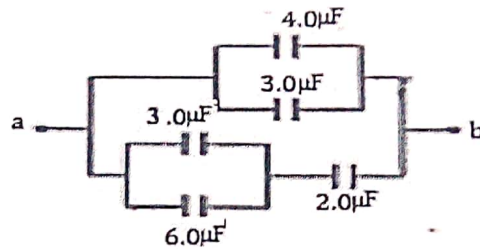


Fig. 1

**QUESTION TWO**

(a) An electrician wanted to use Copper wire and Aluminum wire of a cross-sectional area of  $4.00 \times 10^{-8} \text{m}^2$  to run a connection between two buildings that are 20.0 cm apart. If the resistivity of the Copper wire is  $1.7 \times 10^{-8} \Omega\text{m}$  and Aluminum wire is  $2.82 \times 10^{-8} \Omega\text{m}$ .

- (i) determine the resistance of the copper wire and the Aluminum wire.
- (ii) State which of the wires is advisable to use and why?

(b) Determine the permissible ohmic range of the following resistors in fig. 2 below

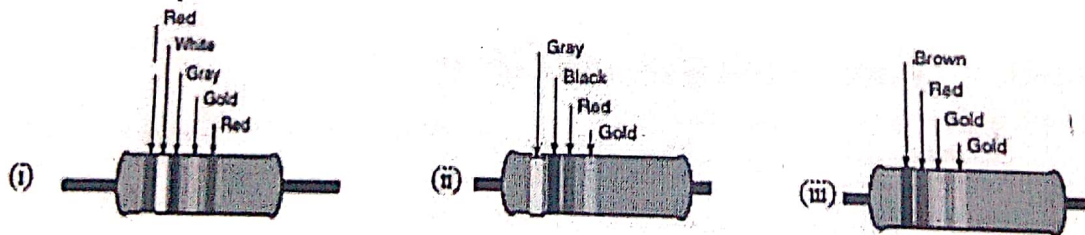


Fig. 2

**QUESTION THREE**

- (a) i. Explain in detail the three factors that affect a capacitor
- ii. State two differences between Series combination and Parallel combination of resistors.
- iii. With the aid of schematic diagram describe resistor, capacitor, diode and inductor
- (b). A resistor of  $7200 \Omega$  was connected across the secondary coil of a transformer that has 620V, if the transformer turns ratio is wound in 1: 6

(c) How much is the...

- (ii) Calculate the value of  $I_p$ .
- (iii) What is the efficiency of the transformer?

**QUESTION FOUR**

- (a) i. What is self-inductance and state the unit
- ii. Show the wave form of a Half and Full wave rectification without a capacitor.
- (b) Calculate the following from fig 3 below (i)  $V_{out(peak)}$  (ii)  $V_{dc}$  (iii)  $I_L$  (iv)  $I_{diode}$  (v) PIV for any diode (vi)

$f_{out}$

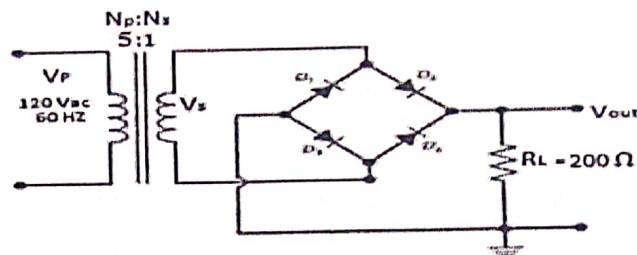


Fig. 3

**QUESTION FIVE**

- (a) i. What is leakage flux.
- ii. In fig. 4 below, determine the total resistance  $R_T$  and Current  $I_T$  of the resistor network

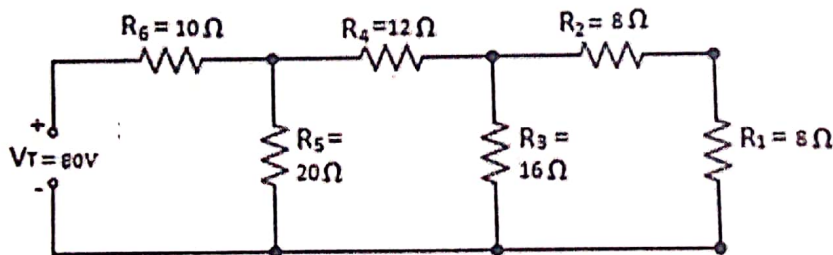


Fig. 4

- (b) A transformer whose primary and secondary voltage ratings are 220 and 60 V, respectively, has a power rating of 380 VA. Calculate the maximum current at
  - i. the primary coil
  - ii. the secondary coil.

**QUESTION SIX**

- (a) i. Describe in detail what is a transformer and four types of transformer.
- (ii) What is mutual inductance between two inductors?
- (b) A 200mH coil  $L_1$  produces  $80\mu Wb$  of magnetic flux,  $60\mu Wb$  of this total flux linked with  $L_2$  that was 300mH.
  - (i) What is the coefficient of coupling between  $L_1$  and  $L_2$ .
  - (ii) Determine the mutual inductance between them